

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

1-36. (Canceled)

37. (Currently Amended) A method of mixing two or more ~~dissimilar~~ fluids comprising:
- (a) introducing one or more fluids into another fluid to form a mixture;
 - (b) introducing the mixture into a region comprising a flow path and a plurality of cavitation zones; the flow path being substantially free of cavitation; the plurality of cavitation zones ~~reducing to~~ reduce at least one of the fluids to a large number of relatively small units, each cavitation zone having a void zone adjacent thereto; and
 - (c) distributing the small units substantially throughout the mixture.
38. (Previously Presented) The method of Claim 37, wherein at least one of the fluids is a gas, and the gas is reduced to a large number of relatively small bubbles.
39. (Previously Presented) The method of Claim 38, wherein at least one fluid is oxygenated by the gas.

40. (Previously Presented) The method of Claim 38, wherein a component within the mixture is oxidized by the gas.

41. (Previously Presented) The method of Claim 37, wherein at least two fluids are liquids and the method results in emulsification of the liquids.

42. (Withdrawn) The method of Claim 37, wherein one of the fluids is an emulsion, and the method results in separation of the emulsion into its constituent components.

43. (Withdrawn) The method of Claim 37, wherein one of the fluids is a liquid having particles suspended therein.

44. (Withdrawn) The method of Claim 37, wherein one of the fluids is a liquid having particles suspended therein and one of the fluids is a gas, the method resulting in gas flotation of the particles to separate the particles from the liquid.

45. (Withdrawn) The method of Claim 37, wherein one of the fluids is a heated gas and one of the fluids is a liquid, the method resulting in a transfer of heat from the heated gas to the liquid.

46. (Previously Presented) The method of Claim 37, wherein one of the fluids is a fuel and one of the fluids is a gas, the method resulting in atomization of the fuel for enhanced burning efficiency.
47. (Previously Presented) The method of Claim 37, wherein at least one of the fluids is ozone, oxygen, air, or any combination thereof.
48. (Previously Presented) The method of Claim 37, wherein the mixture is a pulp slurry, wastewater, an emulsion, or a solution.
49. (Withdrawn) The method of Claim 37, wherein at least one of the fluids contains pulp.
50. (Withdrawn) The method of Claim 49, wherein the pulp is oxidized.
51. (Previously Presented) The method of Claim 37, wherein the region comprises a chamber having a rotor formed with a plurality of irregularities, the irregularities on the rotor inducing cavitation within the mixture.
52. (Previously Presented) The method of Claim 51, wherein the irregularities on the rotor comprise bores formed therein.

53. (Previously Presented) The method of Claim 52, wherein cavitation occurs within the bores.

54. (Currently Amended) A method of oxidizing a molecular compound within a fluid comprising:

- (a) introducing an oxidizer into the fluid to form a mixture;
- (b) introducing the mixture into a region comprising a flow path and a plurality of cavitation zones; the flow path being substantially free of cavitation; the plurality of cavitation zones reducing to reduce the oxidizer into a large number of relatively small units and increase increasing the total surface area of the oxidizer in contact with the molecular compound within the fluid, each cavitation zone having a void zone adjacent thereto; and
- (c) distributing the units of oxidizer substantially throughout the mixture.

55. (Previously Presented) The method of Claim 54, wherein the fluid is a fuel to be burned and wherein the molecular compound, when not oxidized, generates environmental toxins upon burning of the fuel.

56. (Previously Presented) The method of Claim 54, wherein the oxidizer is oxygen.

57. (Previously Presented) The method of Claim 54, wherein the oxidizer is air.

58. (Canceled)

59. (Currently Amended) A method of conducting a chemical reaction between two or more ~~dissimilar~~ fluids comprising:

(a) introducing one or more fluids into another fluid to form a mixture, wherein at least one of the one or more fluids is chemically reactable with the another fluid;

(b) introducing the mixture into a region comprising a flow path and a plurality of cavitation zones; the flow path being substantially free of cavitation; the plurality of cavitation zones reducing to reduce at least one of the fluids to a large number of relatively small units, each cavitation zone having a void zone adjacent thereto; and

(c) distributing the small units substantially throughout the mixture to conduct the chemical reaction.

60. (Previously Presented) The method of Claim 59, wherein the at least one or more fluids has at least one reactant reactable with the another fluid.

61. (Previously Presented) The method of Claim 59, wherein the at least one or more fluids has at least one first reactant and the another fluid has at least one second reactant reactable with the first reactant.

62. (Currently Amended) A method of mixing two or more ~~dissimilar~~ fluids comprising:

(a) introducing at least one first fluid and at least one second fluid into a region comprising a flow path and a plurality of cavitation zones displaced from the flow path to reduce at least one fluid of the at least one first fluid to a large number of relatively small units, each cavitation zone having a void zone adjacent thereto; and

(b) distributing the small units of the at least one fluid of the at least one first fluid substantially throughout the at least one second fluid to form a mixture.

63. (Currently Amended) A method of oxidizing a molecular compound within a fluid comprising:

(a) introducing an oxidizer and the fluid into a region comprising a plurality of cavitation zones to reduce the oxidizer to a large number of relatively small units, each cavitation zone having a void zone adjacent thereto; each cavitation zone having a height dimension and cavitation occurs at a cavitation column height in the cavitation zones; wherein varying the pressure within the plurality of cavitation zones varies the cavitation column height in each cavitation zone; and

(b) distributing the small units of oxidizer substantially throughout the fluid to oxidize the molecular compound.

64. (Currently Amended) A method of mixing a gas and a ~~fluid~~ liquid comprising:

(a) introducing the gas and the ~~liquid-fluid~~ into a region comprising a plurality of cavitation zones to reduce the gas to microscopic bubbles, each cavitation zone having a void

zone adjacent thereto; each cavitation zone having a height dimension and cavitation occurs at a cavitation column height in the cavitation zones; wherein varying the pressure within the plurality of cavitation zones varies the cavitation column height in each cavitation zone; and

(b) distributing the microscopic bubbles of gas substantially throughout the fluid liquid.

65. (Currently Amended) A method of conducting a chemical reaction between two or more ~~dissimilar~~ fluids comprising:

(a) introducing at least one first fluid and at least one second fluid reactable with the at least one first fluid into a region comprising a plurality of cavitation zones to reduce ~~at least one fluid of the~~ at least one first fluid to a large number of relatively small units, each cavitation zone having a void zone adjacent thereto; each cavitation zone having a height dimension and cavitation occurs at a cavitation column height in the cavitation zones; wherein varying the pressure within the plurality of cavitation zones varies the cavitation column height in each cavitation zone; and

(b) distributing the small units of the at least one ~~fluid of the at least one~~ first fluid substantially throughout the at least one second fluid to conduct the chemical reaction.

66. (Previously Presented) The method of Claim 65, wherein the at least one first fluid has at least one reactant reactable with the at least one second fluid.

67. (Previously Presented) The method of Claim 65, wherein the at least one first fluid has at least one first reactant and the at least one second fluid has at least one second reactant reactable with the first reactant.

68. (Currently Amended) The method of Claim 37, wherein at least one of the two or more ~~dissimilar~~ fluids is air and at least another of the two or more ~~dissimilar~~ fluids is fuel oil.

69. (New) The method of Claim 37, further comprising:
aligning an outlet with one of said void zones;
exiting the mixture through the outlet.

70. (New) The method of Claim 37, further comprising:
removing the small units from the another fluid.

71. (New) The method of Claim 63 wherein the height of cavitation varies progressively in different regions within the device creating the cavitation.

72. (New) The method of Claim 64 wherein the height of cavitation varies progressively in different regions within the device creating the cavitation.

73. (New) The method of Claim 65 wherein the height of cavitation varies progressively in different regions within the device creating the cavitation.

74. (New) A method of mixing two or more fluids comprising:
- (a) introducing one or more fluids into another fluid to form a mixture;
 - (b) moving the mixture along a flow path with a plurality of isolated, spaced apart cavitation zones adjacent to and displaced from at least a portion of the flow path; the plurality of cavitation zones inducing shock waves within the flow path that reduce at least one of the fluids to a large number of relatively small units; and
 - (c) distributing the relatively small units substantially throughout the mixture.
75. (New) The method of claim 74 wherein the fluids include a gas and a liquid, and wherein the small units are microscopic bubbles.
76. (New) The method of claim 74 and further comprising:
- (d) moving the cavitation zones with respect to the flow path.
77. (New) The method of claim 74 and further comprising:
- (d) adjusting the displacement of the cavitation zones from the flow path.
78. (New) The method of claim 77 wherein the adjusting step comprises varying the pressure of the mixture within the flow path.